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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,485	03/14/2001	Christopher A. Hazen	Mo-6238/MD00-124	3626

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PATENT DEPARTMENT
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EXAMINER

NAVE, EILEEN ENAD

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,485

Applicant(s)

HAZEN ET AL.

Examiner

Eileen E. Nave

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/14/01-2/4/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4 and 15-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(A) Claim 4 is unclear because it is not clear whether the composition containing dioxin precursors must comprise of (I), (ii) and (iii) all together or at least one of the three. Examiner suggests inserting -- at least one selected from the group consisting of -- after "comprises".

(B) Claim 15 is unclear because it is not clear whether the composition containing dioxin precursors must comprise of (I), (ii) and (iii) all together or at least one of the three. Examiner suggests inserting -- at least one selected from the group consisting of -- after "comprises".

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deer Co.*, 383 U.S. 1, 148 USPO 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geiger et al, Influence of Sulphur on the Formation of Dioxin/Furan during Sewage Sludge Incineration (English Translation), in view of Karasek (US 5,968,467).

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Geiger et al discloses the influence of sulfur on the formation of dioxin/furan during sewage sludge, domestic refuse and special refuse incineration (page 2, column 1 & 2). Solitary incineration of sewage sludge takes place mainly in fluidized bed ovens, with or without pre-drying and individually in rake type ovens or rack type fluidized bed ovens. A very small portion of sludge is used together with other combustibles, e.g., in power stations. The temperatures in the fluidized bed oven lie between 650 °C to 900 °C, depending upon the nature of the sludge. In the hot fluidized layer, the sludge is dried, crushed and incinerated after igniting. Inert components (ash) are drained out with the waste gas. The energy contained in the waste gas is utilized for preheating the combustion air up to 450 °C and/or generating steam. The waste gases are then purified by removing dust, sulfur dioxide, hydrogen chloride and heavy metal in electro-filters and waste gas rinsing apparatus (page 1, column 2).

Geiger et al also discloses that the formation of dioxin/furan formation during incineration of sewage sludge may be because of (a) incomplete destruction of PCDD/PCDF in the combustible, (b) formation of PCDD/PCDF from the existing chlorinated precursors of those formed in the burning process, such as chlorophenols or chlorobenzoles (page 1, column 3) and the "De-novo synthesis" from inorganic chlorine and organic compounds (page 2, column 1). Geiger et al also discloses that with a sufficiently high sulfur-to-chlorine ratio in the combustible suppression of the de-novo synthesis occurs. Sulfur dioxide released by burning sulfur reacts with the chlorine formed due to the Deacon reaction, thus preventing further chlorination of organic

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compounds, which is the preliminary step towards the formation of PCDD/PCDF (page 3, column 2).

Geiger et al does not disclose the step of reducing heat in the gaseous medium form in the incinerating step and removing ash from the gaseous medium with a precipitator. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the heat in the gaseous medium and remove ash from the gaseous medium with a precipitator because Karasek teaches that when exhaust gas leaving an incinerator used to incinerate chlorine-containing waste reaches the electrostatic precipitator or bag filter, or other flyash removing apparatus, its temperature falls to around 300 °C and dioxin precursors inevitably are converted to dioxins at the portions where the exhaust gas is brought into contact with the flyash (col. 4, ln. 45-51).

Geiger et al does not disclose reducing the temperature of the gaseous medium to more than 0 °C and below about 200 °C or adding an adsorbent to the gaseous medium after removing ash. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the temperature of the gaseous medium to more than 0 °C and below about 200 °C and add an adsorbent to the gaseous medium after removing ash in the process of Geiger et al because Karasek teaches preventing the formation of dioxins in an incinerator by injecting a dioxin precursor adsorbent, such as activated carbon (col. 2, ln. 66-67), prior to a point during an exhaust gas treating step where a gas exhausted from the incinerator becomes less than 400 °C (col. 3, ln. 6-11) and that activated carbon in a powdery form can be

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injected into combustion exhaust gas line at temperatures of 120 °C to 250 °C (col. 1, ln. 64-col. 2, ln. 1).

Geiger et al does not specifically disclose that the composition containing dioxin precursors is a mixture of halogenated solvents, such as those recited in instant claim 13; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mixture of halogenated solvents, such as those recited in instant claim 13 because Geiger teaches that the formation of PCDD/PCDF are from chlorinated precursors in the waste to be incinerated (page 1, column 3) and Karasek also teaches that such dioxin precursors include, aromatic compounds such as phenol, benzene, chlorinated aromatic compounds such as chlorophenol or chlorobenzene, chlorinated alkyl compounds, etc (col. 1, ln. 27-30) exist in waste used in various municipal incinerators, such as industrial waste incinerators, medical waste incinerators and burned ash fusion furnaces (col. 4, ln. 56-59).

Geiger et al does not specifically disclose the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims, because Geiger et al teaches that the sulfur is a results-effective variable for suppressing the formation of dioxin and Karasek also teaches that the activated carbon is results-effective variable for suppressing the formation of dioxin; thus, it is within the skill of one of ordinary skill in the art to determine the optimum or routine ranges of the result-effective

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2

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variables through routine experimentation. In re Boesch, 617 F.2d 272, 205 USPO 215 (CCPA 1980).

Geiger et al discloses that the energy contained in the waste gas is utilized for preheating the combustion air up to 450 °C and/or generating steam but does not specifically disclose that a boiler is used for heat recovery. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a boiler for heat recovery from waste gases from incinerators because Geiger et al already teaches heat recovery and one of ordinary skill in the art would use a well known technique such as a boiler to do so in view of unexpected results.

Karasek discloses cooling the exhaust stream to a temperature below of 400 °C but does not specifically disclose that a boiler is used for heat recovery. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a boiler for heat recovery from waste gases from incinerators because Karasek already teaches cooling the waste gas stream and one of ordinary skill in the art would use a well known cooling techniques such as adding water to the waste gas stream to do so in view of unexpected results.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eileen E. Nave whose telephone number is (703) 305-0033.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (703) 308-3837.

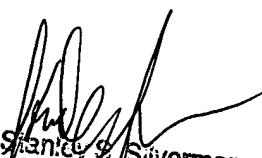
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The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9671 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Nave/een

June 29, 2002



Stanley S. Silverman
Supervisory Patent Examiner
Technology Center 1700